

August 21, 2002

Mr. Michael S. Collins  
U.S. Department of Energy  
Richland Operations Office  
P.O. Box 550 – A6-38  
Richland, WA 99352-0550

Dear Mr. Collins:

Re: Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program  
Environmental Impact Statement (DOE/EIS-0286D), April 2002

This letter transmits the Washington State Department of Ecology (Ecology) comments on the Draft Hanford Site Solid Waste Program Environmental Impact Statement (HSW-EIS) from the United States Department of Energy (USDOE). Our thorough review of the HSW-EIS has identified several omissions and inadequacies which we comment on through this letter and the enclosed *General Summary*. In addition, we have enclosed a very detailed *Table of Specific Comment* in an effort to provide specific ideas and language that would improve the HSW-EIS.

We had hoped that the HSW-EIS would contribute to our confidence both in how Hanford's waste is managed and in the safety and importance of Hanford's role in the overall cleanup of nuclear sites in the country. We are disappointed, therefore, that the Draft HSW-EIS fails to meet this expectation. In short, the Draft HSW-EIS does not provide adequate and much-needed information to help us or the public address major issues. For example:

- What is the net benefit or harm of importing additional wastes for storage, treatment or disposal at Hanford?
- Are there alternatives to burying minimally-treated waste in shallow, unlined trenches?
- What are the long-term costs and requirements for monitoring, maintaining, and preventing failures at, and radioactive releases from, waste sites, and how can we be confident that these activities will be effectively and accountably managed?

More specifically, we find the Draft HSW- EIS deficient in the following areas:

**Scope is too narrow.**

- The Draft HSW-EIS assumes that the 1997 Waste Management Programmatic Environmental Impact Statement (PEIS) adequately compared the effects of treatment and disposal facilities at various sites, but it did not. The PEIS relied on data now several

years old and did not have available even the limited information about Hanford contained in the Draft HSW-EIS.

- The Draft HSW-EIS assumes continued or increased off-site low-level waste and mixed low-level waste disposal at Hanford. It does not separately assess needs for disposing Hanford waste, in spite of widespread requests for such analysis during the scoping comment period.
- The Draft HSW-EIS does not evaluate other options currently under active discussion, such as the lined, RCRA-compliant mega-trench for disposing of low-level waste, expanded use of the Environmental Restoration Disposal Facility (ERDF), permanent disposal of low activity wastes from Hanford tanks in a form other than glass, or storing and treating transuranic wastes from other sites.

**Impact analysis is too limited.**

The Draft HSW-EIS reaches conclusions without apparent adequate data and analysis. It fails to disclose what information was not available for use in arriving at conclusions.

- The Draft HSW-EIS does not include sufficient data about groundwater contamination and movement at Hanford.
- The Draft HSW-EIS does not include sufficient data about the extent and characteristics of wastes and contamination already in the ground at Hanford.
- The analysis of cumulative impacts from the proposed treatment and disposal activities, in conjunction with other reasonably foreseeable actions at Hanford, is extremely limited and not credible based on the material presented.
- The Draft HSW-EIS does not include data about the effects on the full range of plant and animal species, nor does it recognize USDOE's obligation to protect and restore priority habitat, even if it has been degraded by fire or pesticides.

**Regulatory analysis is insufficient.**

- The Draft HSW-EIS does not adequately address the challenges USDOE presently faces in complying with RCRA and state dangerous-waste regulations.

**Consideration of closure, long-term care and costs is very limited.**

The Draft HSW-EIS does not deal with such long-term activities as site closure, corrective action, monitoring, maintenance, and post-closure institutional controls. It also does not assess nor compare disposal alternatives or low and high volumes according to the long-term care requirements imposed by each, and the costs of meeting the requirements.

**Transportation concerns are not addressed.**

The Draft HSW-EIS addresses only on-site transportation of wastes, relying upon the generic and very dated PEIS to cover how waste is transported to Hanford. Anyone who has driven

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along I-182 or SR-240 in the Tri-Cities area knows that land use along those routes has changed dramatically since the 1990 census used in the generic assessment of the PEIS. The Draft HSW-EIS also does not analyze rail transport on or off-site, even though rail transport is under active consideration.

## Summary

We believe the Draft HSW-EIS represents a missed opportunity for moving the discussion of Hanford and nationwide nuclear cleanup to a more productive level. Ecology encourages USDOE to consider reissuing a second EIS which would provide a comprehensive vision that assures the safe treatment, storage and disposal of Hanford's waste, and evaluates alternatives and options for Hanford's role in supporting cleanup nationally. Based on this draft, neither the public nor the state of Washington can address these issues with any confidence. We are hoping that through a revised and more comprehensive Draft HSW-EIS we would be able to evaluate and if appropriate support decisions regarding import of additional wastes to Hanford, hazardous waste permitting activities related to burial grounds and treatment facilities, and several initiatives arising from the Cleanup Constraints and Challenges Team's work.

Thank you for the opportunity to comment on this important document

Sincerely,

[signed 8/21/02]

Tom Fitzsimmons  
Director

2 Enclosures

cc: Keith Klein, USDOE/RL  
Mike Gearheard, USEPA  
The Honorable Robert Wahpat, Chairman, Yakama Indian Nation  
The Honorable Gary Burke, Chair, Board of Trustees, Confederated  
Tribes of the Umatilla Indian Reservation  
The Honorable Samuel N. Penney, Chairman, Nez Perce Tribal Executive  
Committee  
Stuart Harris, Confederated Tribes of the Umatilla Indian Reservation  
Russell Jim, Yakama Indian Nation  
Patrick Sobotta, Nez Perce Tribe  
Michael Grainey, Oregon Office of Energy  
Todd Martin, Hanford Advisory Board

***Draft Hanford Site Solid Waste Program  
Environmental Impact Statement (DOE/EIS-0286D)  
August 21, 2002***

***General Comments  
Washington State Department of Ecology***

**Summary of the Draft HSW-EIS**

The Draft HSW-EIS addresses the management of low-level waste (LLW), mixed low-level waste (MLLW), and post-1970 transuranic (TRU) waste at the Hanford Site. Management of these wastes would involve treatment, storage, and disposal. Treatment, if it occurs, would be at either the Hanford Site, or an off-site commercial facility. Storage would occur at the Hanford Site, and disposal would occur at the Hanford Site for LLW and MLLW, and at the Waste Isolation Pilot Plant (WIPP) for post-1970 TRU.

Three alternatives, for each waste type, are evaluated in the HSW-EIS.

The first alternative, the preferred alternative, generally consists of utilizing existing facilities for storage, commercially treating and/or modifying existing facilities for waste treatment, and filling existing trenches and constructing deeper, wider, trenches and capping them at closure. Post-1970 TRU would be sent to WIPP for disposal.

The second alternative proposes using current capabilities for storage and constructing new treatment facilities. Waste would be disposed in existing trenches and new trenches would be constructed using the current design. All trenches would be capped and closed. Post-1970 TRU would be sent to WIPP for disposal.

The third alternative, the no action alternative, would utilize existing treatment and storage capabilities. No new trenches would be constructed. Once the existing trenches are filled the remaining waste would be placed into indefinite storage. Existing storage facilities would be expanded to manage increased volumes of waste. Commercial facilities would be utilized on a limited basis. MLLW trenches would be capped at closure. Most post-TRU would be sent to WIPP, however, some would remain untreated.

Each alternative was evaluated for a range of waste volumes:

- LLW ranges from 432,582m<sup>3</sup> to 631,427m<sup>3</sup> and includes LLW generated at the Hanford Site and waste imported from other United States Department of Energy (USDOE) Facilities.
- This also includes 283,067m<sup>3</sup> of waste which is already disposed in the Low Level Burial Grounds (LLBG) and
- MLLW ranges from 65,334m<sup>3</sup> to 205,678m<sup>3</sup>, which includes waste that is generated at the Hanford Site and imported from other USDOE and commercial facilities.
- Only one volume is used for post-1970 TRU Waste: 45,806m<sup>3</sup>, the maximum Hanford Site forecast.

The Draft HSW-EIS assumes implementation of the February 25, 2000, Record of Decision (ROD) for MLLW and LLW from the Waste Management Programmatic Environmental Impact Statement (WM-PEIS) (DOE/EIS-0200, May, 1997). That ROD determined that Hanford would continue to dispose of LLW and MLLW generated on-site. The ROD also identified Hanford and the Nevada Test Site as "regional" disposal facilities for LLW and MLLW from other USDOE sites.

### **Issues Concerning Scope and Analysis**

The Draft HSW-EIS essentially evaluates a limited range of near-term alternative means to install treatment capability and to dig waste disposal trenches. It evaluates the effects of doing so for a limited range of waste volumes.

- The Draft HSW-EIS assumes that the WM PEIS adequately compared the impacts of treatment and disposal facilities at various sites, but it did not. At a minimum, the WM PEIS did not have available even the limited information contained in the Draft HSW-EIS. The information used to compare Hanford to other disposal sites in the WM PEIS was never widely available for public review and is not available for comparison with the Draft HSW-EIS.
- The Draft HSW-EIS evaluates only the management of wastes owned by, or coming to, the existing Waste Management Program, touching only lightly on previously buried wastes, environmental restoration wastes, naval reactors, and other wastes disposed near surface at Hanford.
- The Draft HSW-EIS does not evaluate other options currently under active discussion, such as the lined mega-trench or expanded use of the Environmental Restoration Disposal Facility (ERDF).
- The Draft HSW-EIS does not fully evaluate the potential for additional required management of pre-1970 TRU wastes, or corrective action for releases of chemically hazardous wastes from burial grounds filled before 1988.
- The Draft HSW-EIS does not evaluate treatment and storage of significant quantities of TRU waste from other sites.
- The Draft HSW-EIS does not evaluate the impact of permanent disposal of incidental low activity tank wastes in shallow land burial as proposed in the Supplemental Tank Waste Remediation System EIS.

According to NEPA requirements, 40 CFR Part 1500.2(e) the NEPA process should be used to identify and assess reasonable alternatives for the proposed action "that will avoid or minimize adverse effects of these actions." The state of Washington requests that the range of alternatives analyzed be broadened to include "no import of out of state waste" and the "worst case" import scenario based on the WM-PEIS. In addition,

40 CFR Part 1506.2(d) requires Federal agencies to integrate environmental impact statements with the State and local planning process. When there are “inconsistencies of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned)” it should be discussed in the EIS. The Draft HSW-EIS does not acknowledge or discuss the state of Washington’s policies about accepting out of state waste, nor have any reconciliation or mitigation measures been presented.

The Draft HSW-EIS states that the environmental analysis in the document was conducted through the year 2046, which represents the end of most waste management operations at the site. This resulted in the following scope and bounding concerns:

- The post-closure requirements for waste disposal facilities may extend beyond the end of active waste management, which is not indicated by the 2046 date.
- Long term impacts to groundwater and the Columbia River were evaluated for 10,000 years. There is no examination of impacts in the intervening period nor any indication of the extent to which the 10,000 year results are a function of radionuclide decay.

### **Conclusions Not Supported**

The Draft HSW-EIS reaches conclusions without adequate data and analysis. It often fails to disclose what information is *not* known in arriving at conclusions.

- The Draft HSW-EIS does not include sufficient data about either characteristics of disposed waste, or groundwater movement at Hanford.
- The Draft HSW-EIS does not include data about impacts to certain ecological receptors, or about potential harm to restoration of priority habitat that may have been degraded by fire or pesticides.
- The impact assessments underlying the Draft HSW-EIS are not accompanied by uncertainty analyses that would provide some indication of the reliability of estimates and predictions.
- The treatment of cumulative impacts from the proposed treatment and disposal activities, in conjunction with other reasonably foreseeable actions at Hanford, is extremely limited and not credible based on the material presented.

According to the requirements of Title 40 of the Code of Federal Regulations (CFR) Part 1502.22 the foreseeable significant adverse effect on the human environment should be evaluated. Reasonably foreseeable impacts include “catastrophic consequences, even if their probability of occurrence is low.” Based on the USDOEs continued difficulties implementing and maintaining thorough waste characterization, groundwater monitoring at waste disposal sites, and corrective actions, it would not be unreasonable to consider groundwater contamination reaching the Columbia River. Therefore, this environmental impact should be considered. If information is incomplete or unavailable the Draft HSW-EIS is supposed to acknowledge the lack of information. Mitigative measures should be proposed and described as appropriate.

### **Inadequacies of the Regulatory Analysis**

Based on 10 CFR Part 1021.103, in which the USDOE adopts the regulations for implementation of the National Environmental Policy Act (NEPA), 40 CFR Parts 1500 through 1508, the Washington State Department of Ecology has identified several

regulatory inadequacies/omissions in the Draft HSW-EIS. The Draft HSW-EIS does not adequately consider the current regulatory challenges already facing Hanford with regard to dangerous and mixed waste management. The Hanford Federal Facility Agreement and Consent Order (HFFACO) is a compliance agreement for bringing USDOE into conformity with the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Restoration, Compensation and Liability Act (CERCLA), and the Hazardous Waste Management Act (HWMA) requirements for the waste at Hanford. In addition, the Hanford RCRA Permit details requirements for managing dangerous and mixed waste in accordance with state and federal regulations, including corrective action at solid waste management units, and integration of RCRA and CERCLA activities. USDOE continues to struggle to achieve and maintain overall compliance with mixed waste management at Hanford, particularly with regard to characterization, storage, and treatment of mixed waste. Prior to accepting more waste from across the nation, the state of Washington must be assured that current waste management activities at Hanford are protective of human health and the environment and compliant with state and federal regulations, and the Tri-Party Agreement (TPA).

Throughout the Draft HSW-EIS the text is incomplete or silent on RCRA regulatory authorities for waste management facilities, in particular with regard to the LLBG, but also to other facilities such as T-Plant, CWC, WRAP, LERF, ETF, etc. Waste management, permitting, closure, and post-closure requirements for RCRA treatment, storage, and disposal (TSDs) and waste management units are not identified. Corrective action authority to address releases from regulated facilities is unclear. Extensive revision of a number of sections within the document is needed to accurately reflect the regulatory environment. Without clarity on RCRA applicability and extent, bounding conditions can not be properly established and thus alternatives can not be adequately evaluated. Here are specific examples of such omissions:

- The Draft HSW-EIS does not adequately address the limitations imposed by the present Part A designation for the LLBG, and by the requirements that will accompany inclusion of Hanford LLBG in the Hanford Sitewide Permit.
- The Draft HSW-EIS does not adequately address the regulatory requirements for modification of the Part B permits for the Central Waste Complex (CWC), 200 Area Effluent Treatment Facility (ETF), Liquid Effluent Retention Facility (LERF), LLBG, T Plant Complex (T Plant), and the Waste Receiving and Processing (WRAP) Facility.
- The Draft HSW-EIS does not adequately address the regulatory requirements associated with mixed waste and mixed transuranic waste storage and treatment at CWC, WRAP and T Plant.
- The Draft HSW-EIS does not address the treatment requirements associated with mixed waste under Washington law. (**RCW 70.105.050**)
- The Draft HSW-EIS reflects insufficient attention to consultation requirements under the Endangered Species Act.
- The Draft HSW-EIS does not recognize and adhere to the state of Washington's water antidegradation policies (**WAC 173-201A-070**) and the state of Washington's maintenance and protected waters designated as outstanding resource waters (**WAC 173-201A-080**).
- The Draft HSW-EIS does not adequately and/or accurately reflect corrective action regulatory requirements applicable to an evaluation of reasonable alternatives or mitigation measures.

Several regulatory requirements specified in 40 CFR Part 1502 have not been adequately addressed. The purpose and need statement does not adequately specify the underlying purpose and need for the proposed action. The alternatives should include a rigorous exploration and evaluation of "all reasonable alternatives" or an explanation of why they were eliminated. Alternatives not within the jurisdiction of the lead Agency should also be included. The Draft HSW-EIS does not include an adequate description of the affected environment, or the environmental impact. The impacts to the long-term productivity and the irreversible commitment of resources have not been presented to decision makers. The indirect effects of the alternatives and their significance to the Columbia Basin environment have been overlooked. In addition, conflicts between the proposed actions and the objectives of State and local government have not been addressed. The Draft HSW-EIS does not meet the requirements of 40 CFR Part 1508.25(2), addressing the cumulative actions of the recently-approved Hanford Site Accelerated Cleanup with the proposed alternatives, which when viewed together have cumulatively significant impacts and should therefore be discussed in the same impact statement.

### **Groundwater Impacts and Range of Alternatives to Protect Groundwater**

The groundwater quality impact analysis (Appendix G of the Draft HSW-EIS) represents the basis for evaluating reasonable alternatives or mitigation measures. The LLBG groundwater quality impact analysis methodology is deficient in several significant ways:

- 1) the omission of analysis of impacts occurring during operation of the LLBG;
- 2) releases are not assumed to begin until 2046;
- 3) the source term and enabling assumptions are incomplete and lacking in sufficient basis;
- 4) the Point of Compliance for a RCRA TSD facility is the waste site boundary, NOT an arbitrarily chosen point(s);
- 5) characterization data is inadequate, and
- 6) assumptions of no release to groundwater from LLBG are based on inadequate data.

Deficiencies in the current groundwater monitoring networks to accommodate changes in groundwater flow direction, dropping groundwater levels, and "dry" monitoring well, should be addressed, including an estimation of the number and cost of needed wells, or acceptable alternative monitoring. Without this information, the cost analysis contained in the Draft HSW-EIS is also incomplete. These omissions render the impact and cost evaluations 1) non-bounding and incomplete, and 2) do not allow the reader to understand that the groundwater quality impact analysis is not supported by adequate LLBG-specific data.

### **Ecological Assessment/Impacts**

The purpose of Appendix I is to give additional justification to statements made in the sections on ecological impacts found in volume one. Drawing upon various studies, Appendix I identifies most of the ecological systems at risk, but conspicuously omits



several species and guilds such as the microbiotic crust, water fowl, and bald eagles that are identified in the *Biodiversity Inventory and Analysis of the Hanford Site* (The Nature Conservancy, 2000).

Not only does this assessment fail to identify all potentially impacted species, it fails to adequately address potential impacts to species and habitats identified. Risk from chemical contaminants, such as carbon tetrachloride and PCB, associated with MLLW and TRU waste processing respectively, are not evaluated. The impact of increased land use on flora and fauna is dismissed, citing effects of fire and herbicide use. All impacts that prevent recovery of a "priority habitat" must be assessed in addition to effects on currently present habitats and species. There is no quantification or qualification of uncertainties associated with the assessment of potential ecological impact on the site actions. An uncertainties analysis needs to be part of the assessment.

There are conspicuous data gaps that prevent a proper assessment of the potential impacts of the proposed actions on species and habitats. This document does not provide sufficient information on protection of state and federally listed species. Therefore, it is Ecology's opinion that a formal Endangered Species Act Section 7 consultation would be required to ensure protection of Threatened and Endangered Species.

The Draft HSW-EIS tends to ignore a number of ecological assessment/impact issues.

- The Draft HSW-EIS does not provide sufficient information to allow competent decisions to be made.
- The Draft HSW-EIS does not provide a comprehensive list of impacted species and habitats.
- The Draft HSW-EIS does not assess the risk from chemical contaminants.
- The Draft HSW-EIS does not quantify the impacts of proposed actions on all present and future potential habitats.

### **Health Impacts**

It was difficult to follow the details of the health assessments, even for a person with training in radiological dose assessment. It was not always clear as to which exposure scenarios and assumptions were used for a given dose result. The information necessary to understand the details was often found scattered throughout the main document, the appendices, and outside documents. In accordance with 40 CFR 1502.21 material should be incorporated into the EIS by reference, to reduce bulk, but "without impeding agency and public review of the action." The content of the cited material should be briefly described in enough detail to allow for adequate review of the document and proposed alternatives.

As an example, Table 5.23, in section 5.11.1.3, presents health impacts to a resident gardener at the one (1) kilometer well (one [1] kilometer down gradient from the 200 Area) from radionuclides in groundwater. The first point of confusion is that the resident gardener, as specified in Appendix F, is located 20.6 kilometers from the 200 Area, but the table indicates that the assessment point is evaluated at one (1) kilometer from the LLBG. The second point of confusion is that the text does not make clear which exposure pathways are used in the dose calculations. The table caption leads one to think it is only the groundwater pathways, but Appendix F indicates other pathways, such

as external radiation exposure from soil, are also evaluated. If the table is indeed only for groundwater pathways, then where are the results for the other pathways discussed in Appendix F? For each dose result, it should be clear which exposure scenarios in Tables F.35 and F.37 are being used. The third point of confusion is that the reader must go back and forth between the main document, the appendices, and outside documents, to find the details of the results given in the tables. Even then, it is still not clear as to which exposure scenarios are used, and what model parameter values are assumed.

The Draft HSW-EIS tends to ignore a number of health assessment/impact issues

- The Draft HSW-EIS does not allow meaningful comparisons with other state and federal programs responsible for the protection of public health and the environment, the USDOE needs to use standards and methodologies consistent with other federal and state programs for assessing and managing the risks of hazardous substances.
- The Draft HSW-EIS does not develop exposure scenarios for sensitive populations, children, and populations that may be at a disproportionate risk, i.e., Native American populations.
- The Draft HSW-EIS does not make valid assumptions for Technetium-99 (Tc-99) contamination for the 200 West Area. Incorrect assumptions are made regarding the grouted vs. non-grouted Tc-99.
- The Draft HSW-EIS does not clearly indicate what pathways and parameter values were used for each dose result.

The Draft HSW-EIS does not specify which model was used to evaluate the exposure scenarios. If the computer model **RESisual RAD**ioactivity (RESRAD) was used to calculate the doses, it would facilitate the review of impacts to have one example of a RESRAD input and output file as part of Appendix F. Inclusion of these files would clarify which parameters were used, and their values, without having to refer to other documents. In compliance with 40 CFR Part 1502.24, the discussion of analysis in the EIS “shall identify any methodologies used and shall make explicit reference” to the sources used for the conclusions. Several sections of the Draft HSW-EIS did not provide adequate reference for the conclusions provided.

### **Uncertainty Assessment and Quantification**

The uncertainty inherent in the Draft HSW-EIS assessment should be analyzed and quantified. A statistical comparison should be made on dominance and significance of individual elements such as inventory, groundwater and vadose zone flow and transport, and the effect of data gaps in calculating factors such as risk and toxicity for various alternatives.

Many studies have shown that several orders of magnitude of differences usually exist due to lack of information, data gaps, and the uncertainty associated with various elements of the analysis. The level of uncertainty that can be tolerated in the study results must be understood by the decision-makers. The assessment of uncertainty should be used to determine the usefulness of spending additional effort to reduce uncertainty. It should also be recognized that the uncertainty and dominance principles are coupled. Quantification, therefore, is required to determine the individual component's significance in impacts to the receptors. The assessment must not leave out any factors that dominate the results.

### **Consideration Of Closure, Long-Term Care And Costs Is Very Limited**

One of the requirements of 40 CFR Parts 1501.2(b) and (c) include the adequate development of alternatives to enable the decision maker to compare economic and technical analysis. The Draft HSW-EIS does not deal in detail, if at all, with such long-term activities as site closure, corrective action, monitoring, maintenance, and post-closure institutional controls. Nor does it assess, or compare, either disposal alternatives or low and high volumes, according to the requirements imposed by each, and the costs of meeting those requirements. A cost-benefit analysis of the proposed alternatives, including factors not related to environmental quality, should be developed in compliance with 40 CFR Part 1508.23. These issues have not been adequately developed to evaluate the impact to the Hanford National Monument, Columbia River, or local populations. The economic impact of compliant closure, corrective action, monitoring, maintenance, and post-closure institutional controls have not been adequately addressed for an informed decision making process.

### **Transportation Concerns Are Not Addressed**

The draft EIS addresses only on-site transportation of wastes, relying upon the generic and very dated Waste Management Programmatic EIS to cover how waste is transported to Hanford. Anyone who has driven along I-182 or SR-240 in the Tri-Cities area knows that land use along those routes has changed dramatically since the 1990 census used in the generic assessment of the proposed EIS. The Draft Solid Waste EIS also does not analyze rail transport on or off-site, even though rail transport is under active consideration.

### **NEPA Intent Not Adequately Met**

Although NEPA calls for brevity and directs documents to “concentrate on issues that are truly significant,” sufficient evidence needs to be presented to support the conclusions made in this document. NEPA goes on to say that the purpose of the NEPA process is “to help public officials make decisions that are based on the environmental consequences.” The Draft HSW-EIS fails to meet NEPA requirements by:

- Not identifying significant issues of concern to the public raised both in final comments on the WM PEIS and in scoping of the HSW-EIS
- Not integrating NEPA and TPA requirements for the Hanford Site
- Failing to include an alternative not to import off-site waste to Hanford
- Not including a cost-benefit analysis to support alternatives considered
- Failing to fully describe cumulative actions and impacts
- Does not reference support documentation not available to the reviewer – thorough reviews are impossible when cross references are made without available documentation that is not in the public domain, or available as technical literature or guidance
- Relying on reference to historical Hanford technical documentation, policy statements, or historical Hanford environmental impact statements to imply sufficient technical support for the development of exposure scenarios and the conduct of health and environmental evaluations in this Draft HSW- EIS.

- Not addressing its importance as precedent.

**Principal Recommended Corrections to the Draft HSW-EIS:**

- The Draft HSW-EIS should use the same enabling assumptions and modeling input parameters used in Wood (1995), the authorization basis for the LLBG.
- The source term should include the retrievable TRU waste until there is a firm commitment and budget for its removal, or there should be separate analyses that include the retrievable TRU waste.
- Releases should be modeled during operations, and should NOT begin in 2046.
- The Points of Compliance for each waste site should be at the fenceline of the waste management area.
- The possible need for corrective actions under RCRA should be addressed.
- The chosen presumption for remedial action at closure should be evaluated against other alternatives.
- Post-closure monitoring and long-term stewardship issues should be addressed.
- Alternatives put forward through the Performance Management Plan and other vehicles should be clearly addressed.

The purpose of the NEPA process is to provide decision makers with the background data to emphasize real environmental issues and alternatives. This information is to be provided in a full and fair discussion of significant environmental impacts. The environmental issues and alternatives are to be supported with evidence verifying the proposing agency has made the necessary environmental analysis. The Draft HSW-EIS does not identify and evaluate all reasonable alternatives which consider Washington State preferences and plans, the Draft HSW-EIS does not provide mitigative measure to restore the quality of the human environment or to avoid or minimize possible adverse effects of the proposed actions. Therefore, the Washington State Department of Ecology has determined that HSW-EIS is so inadequate that it precludes meaningful analysis; the Washington State Department of Ecology is requesting the USDOE provide responses to the general and specific comments, use comments to revise the Draft HSW-EIS, and prepare and circulate a revised Draft HSW-EIS.

| FC# | Section/Page Ref.   | Category           | Comment  |
|-----|---|--------------------|--|
| 1   | Section 1.0, Page 1.1, Lines 4-7<br>Section 1.3, Page 1.3, Lines 18-20<br>Section S.2, Page S.1, Lines 23-25                  | Scope and Analysis | The Purpose and Need statement appears to support USDOE's complex-wide programmatic need to "enhance and expand management of its existing and anticipated volumes of . . . " While the Purpose and Need statement may reflect USDOE's need, it does not reflect the Washington State Department of Ecology's need. So that the Purpose and Need statement may reflect USDOE's and Ecology's needs, the following Purpose and Need statement is recommended: "USDOE needs to provide safe, protective, and RCRA-compliant waste management capabilities for existing and anticipated volumes of solid LLW, MLLW, post-1970 TRU, pre-1970 containing TRU, commingled-TSCA waste at the Hanford Site." (§ 1502.13)   |
| 2   | Section S.3, Page S.2   | Scope and Analysis | 40 CFR Part 1502.12 requires the summary "to stress . . . areas of controversy (including issues raised by agencies and the public), and the issues to be resolved (including the choice among alternatives)." The section describes the scoping process followed for development of this environmental impact statement. The section indicates that USDOE "considered all of the comments received in its development of this Draft HSW-EIS." Ecology has commented on other associated NEPA documents such as the draft environmental assessment (EA) for trench construction and operation in the 218-E-12B and 218-W-5 Low- Level Burial Grounds (LLBG) (DOE/EA-1373) and the EA for the transuranic (TRU) waste retrieval in the 218-W-4B and 218-W-4C LLBG (DOE/EA-1405). Either in this section or somewhere else in the Draft HSW-EIS, it should be indicated whether USDOE considered Ecology's previous comments on related issues of environmental impact analysis. (§ 1502.12) |
| 3   | Section S.3, Page S.3, Lines 9-14<br>Section S.3, Page S.3, Lines 10-11<br>Section S.8.1, Page S.18, Line 13<br>S.3, Page S.3 | Scope and Analysis | The Draft HSW-EIS states that the environmental analysis in the document was conducted through the year 2046, which represented the end of most waste management operations at the site. This resulted in a number of scope and boundary concerns including: <ul style="list-style-type: none"> <li>➤ The post-closure requirements for waste disposal facilities may extend beyond the end of active waste management (2046).</li> <li>➤ Long-term impacts to groundwater and the Columbia River were evaluated for 10,000 years. How do these ranges compare to the half-lives of the radiological contaminants in question? How long before decay renders these contaminants non-radioactive?</li> </ul>  |
| 4   | Section S.3, Page S.3, Lines 10-11<br>Section 2.2.3.2, Page 2.26, Lines 13-20<br>Figure 2.15, Page 2.27                       | Scope and Analysis | It appears that closure actions and impacts have only been partially included and analyzed in the Draft HSW-EIS. While the Draft HSW-EIS evaluates and bounds consideration of managing wastes in the LLBG, the evaluation is not complete as it does not include a bounding evaluation/analysis of impacts and/or costs of closure (i.e., disposal). The LLBG are permitted as disposal units. As such, disposal is a function of waste management. Similarly, closure is a function of waste management at the LLBG. Therefore, to omit an impact analysis of closure actions and/or costs renders the analysis incomplete and does not provide decision-makers the needed information to make decisions regarding the Draft HSW-EIS at Hanford. Specifically,   |

|   |  |                           |  |
|---|--|---------------------------|--|
|   |  |                           | the Hanford Barrier (an aboveground, multi-component barrier that prevents the entry of rainfall, plant roots, or burrowing animals into the area covered by the barrier) design was assumed a bounding design for analysis purposes. Likewise, the use of the Hanford Barrier was assumed a bounding action (i.e., in-place closure) for analysis purposes. To even partially omit closure action impact and/or cost analysis in the Draft HSW-EIS for disposal units for which protective barriers are regulatory requirements renders the analysis deficient, incomplete, and non-bounding. (§ 1502.14,1502.15, and 1502.16)  |
| 5 | Section S.3, Page S.3, Lines 39-41   | Scope and Analysis        | Clarify if the maximum forecast receipts represents existing Hanford (i.e., on-site) TRU wastes or if the forecast includes receipt of off-site TRU wastes. If the forecast includes receipt of off-site TRU wastes, it is recommended that either the reader be referred to the location in the Draft HSW-EIS where a description/explanation of “maximum forecast receipts” may be found or that the text be clarified. (§ 1502.7)   |
| 6 | Section S.4, Pages S.4 -S.6<br>Section S.4, Page S.4<br>Figure S.2<br>Table S.1, Page S.11<br>Section 1.0, Page 1.1, Lines 18-20<br>Section 1.2, Page 1.3, Lines 5-6 | Scope and Analysis (TSCA) | The <i>Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document</i> (HNF-4755) indicates that waste types covered in the Draft HSW-EIS include TSCA regulated waste (i.e., waste containing polychlorinated biphenyls [PCB], asbestos, or other such regulated components). A number of sections of the Draft HSW-EIS do not appear to identify this waste type. The Draft HSW-EIS and the supporting basis (technical information document) must agree on scope. The text should explain this difference between the Draft HSW-EIS and the supporting information document and explain how the difference was addressed in the Draft HSW-EIS. Due to the use of waste streams for which definitions are not included, the reader cannot discern what waste types are included in the Draft HSW-EIS. (§ 1502.7,1502.14)   |
| 7 | Section S.5.2, Page S.9, Lines 3-12  | Scope and Analysis        | It is indicated that USDOE does not currently have facilities for treating several significant waste streams. It is also indicated that “proposed new facilities are included in the Draft HSW-EIS to provide capabilities for waste treatment and processing.” From the indications, it is unclear whether the Draft HSW-EIS EIS bounding analysis includes potential impacts and costs associated with the proposed new facilities. If the reader is not provided information regarding conceptual plans, design phases, funding profiles, etc. associated with the proposed new facilities, the reader cannot ascertain whether the analysis is bounding. In other words, it is difficult for the reader to determine if the “proposed new facilities” are included in the scope of the Draft HSW-EIS. Clarify, by identification, if the analysis is bounding by the inclusion of impacts and costs associated with the “proposed new facilities”. Clarification may be provided by referring the reader to the appropriate location in the document where the information may be reviewed. (§ 1502.7) |
| 8 | Section S.6.1, Page S.10   | Scope and Analysis        | It is indicated that USDOE “needs to determine which . . . disposal activities are required for properly managing on-site and off-site solid LLW that currently exists, or that may be received at Hanford in the future.” It is also indicated that USDOE “needs to evaluate options for permanent disposal of LLW at Hanford, including expansion and possible reconfiguration of disposal facilities to accommodate anticipated waste receipts.” With so many decisions yet to be made, the wording   |

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|    |  |                    | does not instill confidence that the impact analysis and/or cost estimates included in the Draft HSW-EIS are either comprehensive or bounding. To clarify, include wording identifying/describing how the impact analysis associated with the LLW waste type is bounding. Also, for clarification, include a description of how the decisions will be made in the future (i.e., applicable authorities). (§ 1502.7)   |
| 9  | Section S.6.1.2, Page S.10<br>Table S.1, Page S.11               | Scope and Analysis | The <i>Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document</i> (HNF-4755) indicates that “DOE would treat Hanford’s non-conforming LLW using off-site commercial facilities and dispose of this treated waste in the LLBG. The Draft HSW-EIS states: “Non-conforming waste would be treated to comply with the HSSWAC using existing on-site capabilities, or if on-site treatment capacity does not exist, it would be treated at an off-site commercial facility.” Ecology acknowledges the financial status of the intended off-site commercial treatment facility. Due to the supporting technical information document’s described alternative 1 off-site treatment, the Draft HSW-EIS should identify where the analysis of “enhancement” of on-site treatment facilities or construction of new on-site treatment facilities is included in the Draft HSW-EIS. The analysis should include environmental and cost impacts. (§ 1502.14, 1502.15, and 1502.16)                                       |
| 10 | Section 1.4.5.1, Pages 1.11 – 1.12<br>Section S.6.1.3, Page S.12 | Scope and Analysis | Section 1.4.5.1, Pages 1.11 – 1.12. The section describes the three alternatives analyzed for LLW management at Hanford. The No Action alternative appears to contain “action” as indicated by the following: “DOE would construct new disposal capacity using a trench design similar to that previously employed for disposal of LLW at Hanford. Disposal would take place within the boundaries of currently defined LLBG.” Similarly, the receipt of the disposal volumes identified and the construction of new trenches could be argued to constitute “action.” The reader can neither determine if an environmental impact analysis has been performed for the “currently defined LLBG” nor discern why a No Action alternative would appear to contain “action.” Therefore, provide an explanation and the basis for inclusion of additional waste receipt and trench construction in the No Action alternative. (§ 1502.7, 1502.14)  |
| 11 | Section 5.1, Pages 5.3 – 5.5<br>General Comment                  | Scope and Analysis | The land use section does not include sufficient explanation to allow the reader/decision-maker to understand the supporting technical basis/analysis associated with the various scenarios/alternatives. To explain, Table 5.1 lists upper and lower bounds for alternatives 1 and 2. If the land use areas are compared between “area designated for LLBG,” “area currently occupied,” and upper and lower waste volume bounds there is no explanation for why the numbers are significantly different. For example, for 218-W-3A, the number of 20.4 is the same for all alternatives which may indicate that the entire LLBG which is currently being used in full capacity will be capped as a disposal site. However, for 218-W-3AE, the number of design area (20) is different from current occupation area (12) which is different from upper and lower bound numbers (12.2). The section lacks explanation for the reader/decision-maker to understand what the land use numbers mean under the various scenarios and alternatives. (§1502.7) |
| 12 | Appendix D   | Scope and Analysis | LLBG unit 218-W-5 contingency expansion has been omitted from the appendix.   |

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|    | General Comment  |                    | Similarly, the analysis of borrow pit resources does not include the resources needed in relation to LLBG unit 218-W-5. Similarly, the <i>Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document</i> (HNF-4755) appears to have omitted analysis for LLBG unit 218-W-5. Therefore, the analysis is incomplete and non-bounding. The analysis should either be included in the Draft HSW-EIS or the Draft HSW-EIS should clearly identify that it is not included and should the contingency expansion be necessary in the future, an additional NEPA evaluation will be performed. (§1502.7, 1502.14, 1502.15, 1502.16)  |
| 13 | General  | Scope and Analysis | CWC and WRAP have large amounts of data stored in SWITS, etc. Where LLBG and T-plant have large data gaps. These data groups, as TSDs, should be described separately and their impacts calculated separately due to the available data.  |
| 14 |  | Scope and Analysis | In Section 5.3 and Appendix E, compliance with the ambient air quality standards was shown through the following method: The pollution generated by each project was calculated, then based on the timeline of the projects, the year of maximum pollution generated was determined and the pollution generated calculated. The concern with this approach is the assumption that the projects will occur in the year stated; the possibility that projects may be delayed or start early is not addressed in this calculation. This same method was used to compare the alternatives to each other. The total pollution generation over the life of the alternative should be calculated and these total values should be used to compare the alternatives to each other, not the pollution generated in one year, the assumed maximum year.   |
| 15 | Sec 1.4, Page. 1-5<br>Section S.3, Page S.3, Lines 37-39   | Scope and Analysis | On February 16, 1996, Ecology provided comments to USDOE on the WM PEIS. A major conclusion was that the Draft PEIS failed to provide the whole picture and, as a result, Ecology requested an analysis of cumulative impacts on a site-by-site basis. On January 30, 1998, Ecology provided comments on the scope of the Draft HSW-EIS that identified the need to establish a baseline for solid waste at Hanford. The Draft HSW-EIS, Sec 1.4, alternatives, states that public comments received on the Draft HSW-EIS NOI also encouraged USDOE to focus on Hanford wastes and to understand the impacts from management of those wastes separately from the impacts of accepting additional off-site waste. However, USDOE states that, "The structure of the alternatives . . . did not lend itself to conducting such an analysis. Ultimately, USDOE considered alternatives by waste type." Ecology requests that USDOE analyze cumulative impacts on a site-by-site basis and assess the impact of waste already at Hanford separately from the impacts of waste being received. (Cumulative impacts) |
| 16 | S.1<br>Table S.1, Page S.11<br>Section S.3, Page S.3, Lines 18-24<br>Section S.4, Page S.6, Lines 11-33<br>Section S.4, Page S.6<br>Section S.5, Page S.6<br>Section S.5.3, Page S.9, Lines 33-35<br>Section S.6, Page S.6<br>Section S.6, Page S.10<br>Section 1.0, Page 1.1, Lines 18-20 | Scope and Analysis | The exclusion of pre-1970 TRU waste from this analysis is inappropriate. USDOE has less certainty of the characterization and ultimate environmental impacts of the wastes that were directly buried in the LLBG unlined trenches decades ago. The uncertainties with regard to characterization of these older waste streams should be predominantly considered in the overall analysis of the proposed action. (Scope, uncertainty, cumulative impacts, long-term stewardship)  |



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|    | Section 1.2, Page 1.3, Lines 5-6 |                    |  |
| 17 | S.4, Figure S-2                  | Scope and Analysis | Was TRUM (transuranic-mixed waste) considered and analyzed in the scope of this Draft HSW-EIS? If so, Ecology requests that USDOE indicate under which category those waste streams were considered. If not, USDOE needs to reconsider given the management and impact of TRUM wastes. (Scope)   |
| 18 | S.4, Figure S.2                  | Scope and Analysis | Under the Low-Level Waste box is a category entitled "Previously Buried Waste in the LLBG." From the perspective of applying a regulatory definition, the designation of this waste as "low-level" is correct. However, as the Draft HSW-EIS states on page S.5, "Until 1987, MLLW was managed in the same manner as LLW." In other words, even though dangerous waste constituents were likely to have been present to some unknown extent in this waste stream, USDOE was not obligated to manage the waste as dangerous waste because RCRA was not yet applicable to mixed waste. The importance of this distinction from an environmental perspective is that the waste defined as "low-level waste previously buried in the LLBG" should be significantly considered with regard to the existence and impact of dangerous waste constituents in the LLBG. (Scope, cumulative impacts) |
| 19 | S.8, Page S.17                   | Scope and Analysis | Ecology disagrees with the statement that "For most resources, little or no impact would occur as a result of implementing any of the alternatives." Given the fact that the current situation at Hanford is ill-defined with regard to what has been placed in the ground (i.e., lack of characterization for tank waste, burial grounds, cribs/ponds/ditches) and the current behavior of the waste (i.e., leaking, leaching, moving), it is irresponsible to assume that the addition of more than 30 million cubic feet of waste at Hanford will have little or no impact on the environment. (Ecological analysis, uncertainty analysis, groundwater analysis)  |
| 20 | S.8.2, Page S.18                 | Scope and Analysis | Transportation considerations were not made for shipment of low-level waste or TRU waste to Hanford. However, USDOE stated that in the WM PEIS, they considered that, "Under MLLW Alternative 1, some MLLW would be shipped from Hanford to an off-site treatment facility and returned to Hanford for disposal. As a bounding case, a treatment facility in Oak Ridge, Tennessee, was assumed for purposes of this transportation analysis. Transportation of waste was determined to result in up to four fatalities." Why would USDOE choose an alternative that was determined to result in up to four fatalities? (Ecological analysis)   |
| 21 | S.8.3, Page. S.18                | Scope and Analysis | USDOE states that health impacts were estimated from radionuclides and chemicals that could eventually leach from waste disposed at Hanford and reach groundwater and ultimately the Columbia River. However, uncertainties exist as to the characteristics and volumes of waste that have already been placed (or released) into the ground at Hanford, particularly in the early years to unlined trenches, cribs, ditches, and then via leaky underground storage tanks. Again, there is a need to understand the existing impacts of Hanford's situation separate from the impacts of additional waste from throughout the USDOE complex. (Scope, long-term stewardship)   |
| 22 | Sec. 5.3.2, pp. 5.13 ff          | Scope and Analysis | Please explain: (1) The exclusion of pre-1962 buried wastes from the calculation of long-term impacts; and (2) The means/sources by which 1962-1988 wastes were characterized, particularly with regard to hazardous chemical constituents.  |
| 23 | Appendix A pp. A.4-A.5           | Scope and Analysis | The first comment under A.1.2 is barely acknowledged, and certainly not "dispositioned" by the response on p. A.5. The WM-PEIS did not compare   |

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|    |                                |                    | environmental impacts of disposal of specific volumes and streams of LLW and MLLW at specific sites. Yet the Draft HSW-EIS assumes that the decision has been made and, therefore, provides no basis to compare impacts of disposal at Hanford with disposal at other specific sites.  |
| 24 | p. A.8                         | Scope and Analysis | There is an apparent contradiction in lines 6-12. Please explain why “[s]ome waste that may be generated at Hanford and other USDOE facilities would not be suitable for disposal at commercial facilities under existing permits and regulations,” but “regulations governing disposal of USDOE waste have historically been similar to those for commercial facilities.”   |
| 25 | p. A.8                         | Scope and Analysis | Please clarify the parenthetical statement in lines 9-10 to acknowledge that pre-1970 wastes disposed within designated Solid Waste Management Units pursuant to _____ will be subject to closure and corrective action provisions of _____. Further, please acknowledge that retrieval actions that include transuranic wastes will result in additional wastes to be stored, treated, characterized, packaged and shipped to WIPP for disposal.  |
| 26 | p. A.9                         | Scope and Analysis | Please explain the claim that impacts of disposal of wastes in canyon facilities would be bounded by assessment of impacts of disposal in burial grounds. Are packaging, migration pathways, interaction with adjacent wastes and contamination, emissions during construction and operation, etc., all the same as or less than burial ground disposal?   |
| 27 | pp. A.12-A.13                  | Scope and Analysis | The lower bound estimates based on the SWIFT forecast are not responsive to the commenters’ requests for a Hanford baseline, because they assume continued disposal of off-site waste.   |
| 28 | pp. B.19-B.23                  | Scope and Analysis | All options for contact-handled TRU waste (CH-TRU) assume that retrievable waste will be characterized in-trench and that 50% will be determined to be LLW and left in the trenches. Please explain (a) how in-trench non-destructive characterization will meet regulatory requirements for waste analysis and acceptance; and (b) the basis for the 50 % estimate.   |
| 29 | Table C.1, pp. C.3-C.4-C.5-C.6 | Scope and Analysis | <ol style="list-style-type: none"> <li>1. It appears that the Hanford volume includes wastes already disposed from off-site and on-site generators. Please clarify that this is the case.</li> <li>2. Please explain the selection of smaller volume (78,883 m<sup>3</sup>) of waste for Oak Ridge as the upper bound for the USDOE comparison, as the potential volume appears much larger in Table C.1. Please explain the origin of the estimates, as Oak Ridge was apparently not consulted (not listed as off-site forecasted waste generator or potential off-site generator, per p. C.5-C.6.)</li> <li>3. Please explain the basis for estimating isotopic and chemical content of speculative volumes included in upper bound estimates in Table C.1.</li> </ol> |
| 30 | Sec. C.4, p. C.8               | Scope and Analysis | <p>The discussion of TRU waste volumes should be expanded to deal with the following:</p> <ul style="list-style-type: none"> <li>• Distinguish between CH and RH TRU. The management, storage, packaging, transport and disposal requirements for the two categories are different, and the analysis requires distinguishing the two inventories.</li> <li>• Relationship of these volume estimates to (a) WIPP capacity, given that the National TRU Waste Management Plan (Rev. 2) anticipates less than 15,000 m<sup>3</sup> combined of TRU from Hanford, and (b) the Hanford TRU Disposition Map (IPABS-IS (8/28/01) which projects a WIPP disposal volume of 24,731 m<sup>3</sup>.</li> </ul>  |

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| 31 | Table C.2, p. C.4   | Scope and Analysis    | Please explain the discrepancy between the “previously disposed” figure for LLW (283,067 m <sup>3</sup> ) and the estimate contained on p.13 of the Information Package on Pending Low-Level Waste and Mixed Low-Level Waste Disposal Decisions under the PEIS and derived from the 1996 Integrated Database (640,000m <sup>3</sup> ).  |
| 32 | Appendix H  | Scope and Analysis    | As USDOE is actively considering use of rail transport for inter-site shipments, please include an analysis of the potential impacts of rail shipment and/or inter-modal transfer of TRU, MLLW and LLW on-site.   |
| 33 | Section 1.5.3., Page 1.23, Lines 26-38  | Scope and Analysis    | Reference is made to the June 2000 Environmental Assessment for Disposition of Surplus Hanford Site Uranium. The draft refers to 825 MTU which is to be stored in the 200 area pending final decision about its disposition. Assuming it is USDOE’s intent to dispose of the material in the LLBG, is this material included in the inventory of wastes to be disposed? Is it included in the source term for assessment of long-term impacts? If so, how does it affect the finding in the WM-PEIS that for larger volumes of disposal of LLW at Hanford, groundwater standards for U-238 would be exceeded (WM-PEIS, p. 11-34)? |
| 34 |   |                       | On page 1.5, under <b>Operational Period</b> , in line 12, LLBG closure is to take place after 2046. Will any type of interim cover be placed on top of the LLBG? Why can’t USDOE use a close-as-you-go approach for the LLW trenches that apparently will be used for the MLLW trenches? This close-as-you-go approach may be performed on individual trenches or on a group of trenches.  |
| 35 | Chapter 4; Section 4.4.   | Scope and Analysis    | Some mention should be made of the depth distribution of earthquakes. Most in and around the Hanford Site are shallow (i.e., < 15 km--including the swarm events), but there are a few deeper events in the Horse Heaven Hills (and elsewhere).   |
| 36 | Chapter 4; Page. 4.34, Paragraph 1.   | Scope and Analysis    | Additional information would be helpful, such as the date of installation of the strong motion accelerometers, the trigger levels, and whether any of these facility accelerometers have ever triggered because of an earthquake.   |
| 37 | Page. S.20  | Scope and Analysis    | Reference should be made as to the basis of these costs and how and where they are presented in detail.   |
| 38 |   | Scope and Analysis    | Reference is made to a Design Basis Earthquake. Section 4.5 does not contain any recurrence curves or indicate the manner in which the Design Basis Earthquake was selected and the free-field ground motion likely to occur at the LLBG sites as a result of this earthquake. Please correct.  |
| 39 | Chapter 4; Page. 4.37, Sect. 4.5.2, Paragraph 3   | Scope and Analysis    | Leaking raw water lines have provided significant artificial recharge to the ground in the 200 Areas. Some of these unneeded raw water lines are being cut and capped and others are being pressure tested to assure integrity. However, until this process is accomplished throughout the 200 Areas, these old raw water lines that have exceeded their design life will continue to provide artificial recharge to the soil, and this can be a problem in the vicinity of waste management facilities. Please address.  |
| 40 |   | Scope and Analysis    | On page 1.8, line 19, “other solid waste” is mentioned. Please give examples of solid wastes that are outside the scope of this Draft HSW-EIS.  |
| 41 |   | Scope and Analysis    | On page 1.11, line 36, the Draft HSW-EIS mentions “other suitable locations,” but does not provide any criteria for such a location.  |
| 42 | Section 1.4.4.1, Page 1.9<br>Section 1.4.4.2, Page 1.10, Lines 24-25<br>Section 1.4.4.2, Page 1.10, Line 34<br>Section 1.5.1.2, Page 1.15 | Inadequate Regulation | Throughout the Draft HSW-EIS, the text is incomplete or silent on RCRA regulatory authorities for waste management facilities in particular with regard to the LLBG, but also to other facilities such as T-Plant, CWC, WRAP, LERF, ETF, etc. Waste management, permitting, closure and post-closure requirements for RCRA TSDs   |

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|    | Section S.4, Page S.6, Lines 25-26<br>Section S.5.2, Page S.8, Lines 21-22<br>Section S.5.2, Page S.8, Lines 31-32<br>Section S.6.1, Page S.10<br>Section S.6.1.1, Page S.10, Lines 29-31<br>Section S.6.1.2, Page S.10, Lines 41-42<br>Table S.1, Page S.11 |                       | and waste management units are not identified. Corrective action authority to address releases from regulated facilities is unclear. Extensive revision of a number of sections within the document are needed to accurately reflect the regulatory environment. Without clarity on RCRA applicability and extent, bounding conditions cannot be properly established and thus alternatives cannot be adequately evaluated.  |
| 43 | Section S.6.1.3, Page S.12<br>Section S.6.2.3, Page S.13<br>Section S.6.3.3, Page S.15   | Inadequate Regulation | The section does not identify that the No Action Alternative would not enable USDOE to comply with the waste management and land disposal restrictions of the State Dangerous Waste Regulations including RCRA requirements. Similarly, the section does not identify that the No Action Alternative may not enable USDOE to comply with their own policy for disposal of LLW wastes. Either in this summary section or in another summary section, the affects of non-compliance should be disclosed. Note: the <i>Final Environmental Impact Statement for the Tank Waste Remediation System Summary</i> (DOE/EIS-0189F) includes such a disclosure for the No Action Alternative (see page S-38).<br>(\$ 1502.7)  |
| 44 | Section 1.5.1.1, Page 1.15, Lines 14-16<br>Section 1.5.1.2, Page 1.15<br>Section 1.5.1.2, Page 1.16, Lines 1-12<br>Section 6.3, Page 6.2   | Inadequate Regulation | The Draft HSW-EIS describes coordination between RCRA and CERCLA regarding cleanup of past Hanford disposal sites giving a generic description of the HFFACO. While such coordination is desirable, it is not always achieved. To explain, the LLBG units are RCRA TSDs. As such, ongoing waste management, closure, post-closure, and corrective action will be decided upon via RCRA decision processes. In addition, the CERCLA cleanup schedule for the CERCLA-designated source operable units in which LLBG units reside, is scheduled to occur in or around 2024. However, LLBG units are currently planned to continue to be managed as active TSD units for at least two decades after 2024. The text should identify that the LLBG units are RCRA TSDs via which waste management, closure, post-closure, and corrective action will be permitted by the Washington State Department of Ecology via the state's RCRA authorization basis.<br>(\$ 1502.14(c)) |
| 45 | Section 6.2, Page 6.2, Lines 7-8   | Inadequate Regulation | Page 6.2, Section 6.2, Lines 7-8. Include an identification of other relevant HFFACO milestones. For example, identify that HFFACO Milestone M-20 includes a milestone for the submittal of LLBG unit final status permit applications. Similarly, identify that Milestone M-24 constitutes the HFFACO schedule for installation of RCRA groundwater monitoring wells.<br>(\$1502.7)   |
| 46 | S.5.2.   | Inadequate Regulation | The Draft HSW-EIS does not provide enough information regarding the evaluation of commercial treatment facilities. The Draft HSW-EIS also does not provide enough information as to the alternative of shipping wastes directly from their current location to the commercial treatment facilities, rather than routing the complex-wide wastes to Hanford for storage then again off-site for treatment. (Regulatory analysis)  |
| 47 | S.5.3, Page S.9  | Inadequate Regulation | Throughout the Draft HSW-EIS, USDOE builds on the assumption that the LLBG would "ultimately be closed by applying a cap consisting of soil, sand, gravel, and asphalt to reduce water infiltration and the potential for intrusion." Although capping the LLBG may be one viable alternative for consideration, it is certainly not the only one. Closure and post-closure decisions will be made, in part, based on the events   |

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|    |                            |                       | that occur during operation of the unit, including any releases. Also, depending on releases or threats to human health and the environment during operation, corrective action may dictate closure and post-closure scenarios. Further, the final RCRA closure plan for the LLBG dangerous waste permit has not yet been completed, and final closure decisions have not yet been defined. Also, post-closure alternatives and their impacts were not presented in the Draft HSW-EIS. (Regulatory analysis)   |
| 48 | S.6, Page S.10             | Inadequate Regulation | On February 16, 1996, Ecology provided comments to USDOE on the WM PEIS. A major conclusion was that the Draft PEIS was not adequate to select sites within a conceptual alternative. Likewise, on January 30, 1998, Ecology provided comments on the scope of the Draft HSW-EIS that included the need to perform a systematic comparison of candidate sites. However, the Draft HSW-EIS, Sec S.6, Description of Alternatives, describes a very limited focus of alternatives, all of which consider only management of USDOE complex waste at Hanford. USDOE is encouraged to perform the comparisons as requested by Ecology, and then present the results and rationale to the public for review and consideration. (Regulatory analysis)   |
| 49 | S.6, Page S.10             | Inadequate Regulation | The LLBG is a RCRA TSD unit, with various problems associated with it, including characterization (or the lack thereof) of existing wastes that are buried and/or stored in the unit, the current and/or potential impact to the vadose zone and groundwater, and the associated ability (or lack thereof) to monitor these impacts. Compliance with RCRA requirements is required for management of wastes within this TSD. The proposed alternatives, limited as they are (see comment #10 above), need to consider the impacts on the LLBG from a RCRA TSD perspective, since the proposed addition of waste is within the boundary of a TSD unit with questionable integrity, e.g., USDOE needs to consider the alternative of creating a new space(s) for treatment, storage, and disposal of complex-wide waste so that the integrity and management of the waste stream(s) can be properly managed from the start, thus enhancing the ability and confidence for safe and compliant management. Ecology is not interested in compounding the problems for the LLBG, e.g., alternatives other than expanding an already questionable TSD should be considered. (Regulatory analysis) |
| 50 | Section S.6.3, Page S.14   | Inadequate Regulation | USDOE states that "additional processing and certification capabilities must be developed and implemented at the Hanford Site" for meeting WIPP acceptance criteria. Please specifically identify what additional processing and certification capabilities need to be developed and implemented for wastes considered by this Draft HSW-EIS and identified for eventual disposal at WIPP. (Regulatory analysis)   |
| 51 | Section S.6.3.1, Page S.14 | Inadequate Regulation | Like LLBG, the T Plant Complex is a RCRA TSD unit. Compliance with RCRA requirements is required for management of mixed waste within this unit. Specifically, what modifications to the T Plant Complex are anticipated? How does this work fit in with the priorities already established and funded for processing Hanford wastes?  |
| 52 | 3.3.1, Page 3.6            | Inadequate Regulation | USDOE states, "For purposes of analysis, this Draft HSW-EIS assumes that WIPP would have the necessary administrative and permitting authority to accept these wastes." This is an unfounded assumption given the fact that the current waste acceptance criteria for WIPP does not allow PCB's. Should the state of New Mexico decide at some point to modify the WIPP Permit and allow for the disposal of PCB waste, then that decision could be factored in at that time. However, for the   |

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|    |                          |                       | purposes of this Draft HSW-EIS, analysis should be revisited with respect to and reflection of the current permitting requirements for WIPP.   |
| 53 | p. A.12                  | Inadequate Regulation | Pre-1970 buried transuranic wastes that may be retrieved from burial grounds under CERCLA are outside the scope. Yet they may directly impact the need for facilities described in Sec. 3.3, and CERCLA decision schedules may not match schedules assumed in this Draft HSW-EIS.  |
| 54 |                          | Inadequate Regulation | On page 2.5, line 23, "cover and caps" are used. Are these equivalent terms? Caps are mentioned in the glossary, but covers are not.   |
| 55 |                          | Inadequate Regulation | The Nuclear Regulatory Commission (NRC) requires solidification/encapsulation media to be supported by a Topical Report (TR) approved by a governmental body. These TRs provide the technical information and testing necessary to ensure solidification media (e.g., certain types of concrete) and encapsulation techniques will be effective in the disposal environment. In the text box on page 2.6, cement and thermoplastics are mentioned, but not footnoted to show a TR (or equivalent document) documenting the materials' adequacy in the Hanford LLBG. Is there such a document showing the adequacy of cement and thermoplastics in the Hanford climate?   |
| 56 |                          | Inadequate Regulation | On page 2.23, the Draft HSW-EIS discusses the use of in-trench grouting and encapsulating the waste in concrete. Commercially, most of the nuclides that make up the Class A and B/C waste tables have limits based upon volume (and alpha emitters are based upon specific activity). The in-trench grouting volume is rather large by commercial standards. Does USDOE have an outside peer-reviewed performance assessment that indicates that radionuclide migration from the grouted structure will not exceed a regulatory dose limit (e.g., 25 mrem) over the next 10,000 years?  |
| 57 |                          | Inadequate Regulation | On page 6.11, line 12, the Draft HSW-EIS implies that USDOE will not always comply with USDOT regulations (i.e., Title 49 CFR) on roads to which the public does not have access. Is this correct? In the early 1990s at the annual LLRW convention in Las Vegas, a USDOE contractor representative committed to adhering to USDOT regulations for all shipments both on and off the Hanford Reservation. For shipments of radioactive (only) waste off-site, will the NRC's Uniform Manifest (e.g., NRC Form 540, 540A, 541, 541A, 542, and 542A) be utilized?  |
| 58 | Section S.6.1, Page S.10 | Inadequate Regulation | It is indicated that USDOE "needs to determine which . . . activities are required for properly managing on-site and off-site solid LLW that currently exists, or that may be received at Hanford in the future." It is also indicated that USDOE "needs to evaluate options for permanent disposal of LLW at Hanford, including expansion and possible reconfiguration of disposal facilities to accommodate anticipated waste receipts." The LLBG are solid waste management units (SWMUs). The Washington State Department of Ecology is authorized to implement RCRA corrective action for releases from SWMUs. To date, there are inadequate means for detecting releases from the LLBG (more detailed comments on this issue will follow) and there has been little to no characterization for potential releases from the LLBG. The Draft HSW-EIS does not reflect that RCRA corrective action decisions, if necessary, will be made by Ecology. Due to the lack of detection capabilities and contaminant release characterization information, for the Draft HSW-EIS to omit an acknowledgment of the uncertainties as well as the potential shared authorities |

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|    |  |                       | associated with determining which activities are required for properly managing wastes renders the document incomplete.<br>(§ 1502.14, 1502.15, and 1502.16)  |
| 59 | Section 4.5.1.4, Page 4.36, Paragraph 4          | Inadequate Regulation | Groundwater monitoring for the LERF, a RCRA TSD unit, is currently not occurring. So, the construction of the facility may be compliant, but it is not a totally compliant facility, as your statement implies.   |
| 60 | Section 4.5.1.4, Page 4.37 Paragraph 1           | Inadequate Regulation | Suggest changing the second sentence to read, "It is a Washington State permitted facility containing drain fields where tritium-bearing wastewater discharge is authorized in the permit.."  |
| 61 | Chapter 4; Page. 4.37, Sect. 4.5.1.5, Sentence 2 | Inadequate Regulation | Suggest inserting the word "historic" between "no" and "flood events." The 200 Areas Central Plateau is a flood bar deposited during Quaternary cataclysmic floods.   |
| 62 |  | Inadequate Regulation | The text box on page 2.12 mentions that the floors will be sealed with impervious epoxy resins. Commercial industry experience indicates that this sealant is not permanent and requires repairs. Will the floors in these new buildings be inspected to find any "holes" in the sealant?   |
| 63 | Specific   | Ecological Assessment | <i>Page 3.13, Table 3.5, Comparison of Impacts Among the Alternatives</i> , In the Environmental Consequence Category under Ecological Resources, why was only the temporary Shrub-Steppe Habitat looked at? Besides vegetation/fauna there are biological aspects that need to be factored in. An encompassing vertebrate such as the Great Basin Pocket Mouse could be evaluated as well.   |
| 64 | Specific   | Ecological Assessment | <i>Page 5.22, Lines 13-16</i> , beginning with "To avoid impacts . . ." The planning in this scenario to avoid impacts is great. It benefits the reader of this Draft HSW-EIS to know that not everything is a detrimental effect to the complete ecosystem.  |
| 65 | Section S.7, Page S.17, Lines 21-25              | Ecological Assessment | Page S.17, Section S.7, Lines 21-25. Include an identification that shrub-steppe is considered a priority habitat by Washington State because of its importance to sensitive wildlife.<br>(§ 1502.7)  |
| 66 | Appendix I, Page I.1 Lines 15-18                 | Ecological Assessment | The document states that environmental impacts to the Columbia River would happen in the long term "up to 10,000 years post closure." The document does not provide a minimum time until impact would be seen on the river. Please provide the lower bound time frame for impacts of waste handling operation on the river.   |
| 67 | Appendix I, Section I.2 , Page I.2               | Ecological Assessment | The argument is made that due to the application of herbicide or effects of fires no priority habitats would be affected by any of the alternatives. The fact that a potential priority habitat was destroyed by fire or herbicide application is not justification for excluding that habitat from consideration of potential damages caused by construction of LLBG facilities. Not only must the current occurrence or state designated priority habitats be protected, but historic occurrence of priority habitats must be allowed to reestablish. Expansion of the facilities would necessitate expansion of the areas where spraying occurs and result in increased destruction of habitat. This impact is not assessed in the Draft HSW-EIS. The impact of an enlarged spray area should be assessed. |
| 68 | Appendix I, Section I.2, Page I.2                | Ecological Assessment | The impact of blasting of bedrock as part of surface cover mining operations in the 300 Area on wildlife in the 300 Area as well as in the ALE is not assessed. The impact of the use of high explosives to excavate cover materials needs to be assessed.  |

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| 69 | Appendix 1, Section I.2, Page 1.2               | Ecological Assessment | No mention is made of surface microbiotic crust including algae, fungi, lichens, and mosses. The 1999 Nature Conservancy report <i>Biodiversity Inventory and Analysis of the Hanford Site</i> ) states: "Although the ecological role of the macrobiotic crust within the shrub-steppe is not well understood, it clearly plays an important role in ecosystem functioning by reducing erosion, contributing nitrogen and organic carbon to the soil, and increasing infiltration of precipitation into the soil. Intact crusts can also enhance native seedling establishment in arid ecosystems (St. Clair et al. 1984), and may discourage invasion by non-native species such as cheatgrass." Therefore, the impact on this segment of the terrestrial ecosystem needs to be evaluated. |
| 70 | Appendix I, Section I.2 Page I.2, Line 22       | Ecological Assessment | Several sections mention that due to fire or herbicide "priority habitats" would not be disturbed. The "priority habitat" moniker denotes the most important habitat to protect. Even if priority habitats are not affected, that does not mean that unmitigated destruction of habitats other than "priority habitats" can occur. The impact of actions to all habitats should be evaluated and documented.   |
| 71 | Appendix I, Section I.2.1, Page I.8, Line 37-39 | Ecological Assessment | This section states that a more comprehensive ecological survey of Area C will be conducted in the spring of 2002. The progress of that study should be updated and the results should be incorporated in this document. Without this information it is impossible to make a determination on action proposed in this area.  |
| 72 | Appendix I, Section I.3                         | Ecological Assessment | The criteria for selection of species used in the Ecological Contaminant (ECM) model should be provided. The model allows for selection of many different food web components; the rationale for selection of these particular species should be provided.   |
| 73 | Appendix I, Section I.3, Page I.9, Line 6       | Ecological Assessment | The document references ECM as the risk assessment model for ecological receptors. The model inputs and outputs should be provided so that the modeling process can be evaluated. Additionally the source and nature of the model should be provided. his model should be made available for evaluation by listing a contact or reference in the references. Upon consulting with USDOE-PNL it was determined that the information relating to the model parameters and algorithms is contained in the Columbia River Comprehensive Impact Assessment part 1 (DOE/RL-96-16, Rev 1, Final, U.S. Department of Energy, Richland, WA March 1998) this reference should be cited in the document.  |
| 74 | Appendix I, Section I.3, Page I.11, Line 8-9    | Ecological Assessment | Uranium is the only chemical evaluated for its non-radiological risk. The Groundwater Section 4 Table 4.9 lists chemical contaminants in groundwater including carbon tetrachloride, cyanide, chloroform, tetrachloroethene, and trichloroethene. These chemicals as well as other chemicals originating from the MLLW and TRU, such as PCBs, present a risk to terrestrial and aquatic receptors. The potential risk of toxic (non-rad) components of the MLLW/TRU needs to be evaluated.   |
| 75 | Appendix I, Section I.3, Page 1.11, Line 15     | Ecological Assessment | The statement is made that the risk assessment generally follows EPA ERAGS Guidance. Information should be provided on ways that it differs from EPA guidance.   |
| 76 | I.3/I12/L,13                                    | Ecological Assessment | This sentence states that "best" estimates were used to derive K <sub>d</sub> values for soil and sediment. The scientific basis for the "best" estimates should be provided.  |
| 77 | I.3/I.12/ L,2-5                                 | Ecological Assessment | This sentence introduces a seep dilution term. There is some confusion about the dilution of groundwater by seeps. Seeps are defined as "Groundwater/Surface   |



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|    |                    |                       | Water connections caused by river or stream erosion into a near-surface aquifer" (The Facts on File Dictionary of Environmental Science, Stevenson and Wyman 1991). An additional dilution factor for seeps is not appropriate due to the fact that a seep is a connection point between groundwater and surface water. This dilution factor should be removed.   |
| 78 | I.3/I12/L,7-8      | Ecological Assessment | This sentence states that soil concentrations are derived by multiplying seep concentrations by $K_d$ . The $K_d$ values are not provided in table I.2. $K_d$ values should be provided as well as the basis for their derivation.  |
| 79 | I.3/I.3/ Table I.3 | Ecological Assessment | This table presents the EHQ for various receptors at or around the Hanford Site. The derivation of this data is not presented other than stating that it was developed using the ECEM model. The inputs and modeling assumptions should be presented.   |
| 80 | I.3/I.13/I, 23     | Ecological Assessment | A modifying factor of 15 was selected to convert acute mortality to a Lowest Observed Effect level. What is the rationale for the selection of 15 as a modifying factor? A commonly accepted modifying factor for acute to chronic is 10, but another factor of 10 would be assessed to go from chronic mortality to a chronic response other than mortality. Additionally, another factor of 10 would be assessed to extrapolate from Gambusia to species that inhabit the Columbia River and another factor of 10 might be added to account for interspecific variability. This would result in a modifying/uncertainty factor of 1,000 to 10,000. While this might be overly conservative, the data to support a MF/UF of 15, a conservative value, is needed. Even if the MF/UF was 100 the risk of Hanford plus background would exceed acceptable risk levels. This information section needs to be reanalyzed and re-evaluated to account for the degree of uncertainty associated with the toxicological values. Additionally, data sources for toxicological data should be presented.   |
| 81 | I.4/I.14           | Ecological Assessment | The "consultations" presented here are not formal ESA consultations as defined in Section 7 of the Endangered Species Act. They are merely the first step in a ESA section 7 consultation. These letters simply ask for a list of species that may be affected. Due to the fact that endangered species are present on the Hanford Site and in the Hanford Reach of the Columbia River, a formal ESA Section 7 Consultation should be required by NMFS and FWS. The letter enclosed in Appendix I from the US FWS mentions the fact that a Section 7 Consultation is required, but no response to this requirement is included in the Draft HSW-EIS. The method for conducting this process for NMFS is detailed in "Procedures for Conducting Consultation and Conference Activities Under section 7 of the Endangered Species Act (March, 1998)." Additionally the USFWS produced a document <a href="http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm">http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm</a> that details their requirements for a Section 7 consultation. The listing of potentially affected species is only the first step in the consultation, if any threatened or endangered species are present and MAY be affected, then a formal consultation would be required. The evidence provided in the Draft HSW-EIS does not support a claim that there is not potential adverse affects to T&E species therefore a Formal Section 7 consultation should be required. Additionally there is no documentation of any efforts to contact the USFWS for a determination of state listed species of concern. |
| 82 | Specific           | Health Impacts        | <i>Page 2.22, Lines 16-19</i> , beginning with, "The concrete used . . ." Which certain radionuclides does this pertain to and can there be specific examples noted in other  |

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|    |  |                | parts of the Draft HSW-EIS? The following sentence goes on to state water affecting solubility of some waste elements. It would be nice to see these effects correlated in the risk assessment and know the outcomes of specific $K_d$ coefficients for these "certain radionuclides."   |
| 83 | General  | Health Impacts | There are a variety of definitions used for cumulative risk across the USDOE complex. Ecology should use the definition as defined from EPA's (2002) Framework for Cumulative Risk Assessment. "Cumulative risk: The combined risks from aggregate exposures to multiple agents or stressors."   |
| 84 | App F page 38 Line 27-28.  | Health Impacts | Mercury can be present in the environment in many chemical forms (divalent, methylated, etc.) and with different transfer mechanisms. There needs to be an explanation on why the $K_d$ value for lead is sufficient for mercury.  |
| 85 | Section 4.8.2. Page 4.77<br>Appendix F, Section F.1.4.5, Page F.36 | Health Impacts | Environmental Justice – This section briefly reviews some of the Executive Orders and census tract information associated with minority populations in the Hanford area. Relevant to this discussion would be citations that are associated with potential disproportionate risks assumed by minority populations, specifically Native American populations, because of cultural based behaviors. The Columbia River Inter-tribal Fish Commission (CRITFC) has numerous technical publications and surveys that should be recognized and used in the Draft HSW-EIS.  |
| 86 | Appendix F, Section F.1.4, Page F.29 – F.36                        | Health Impacts | Two exposure scenarios are used by the Draft HSW-EIS for human health evaluations, the industrial scenario (F.1.4.1) and resident gardener scenario (F.1.4.2). Exposure parameters are provided in Tables F.35, F.36, F.37, and F.38. These two exposure scenarios are insufficient to account for the potential human exposure patterns that might occur. Neither of these exposure scenarios recognizes nor account for minority populations (Native Americans) that may be placed at a disproportionate risk. The Draft HSW-EIS dismisses the Model Toxics Control Act (MTCA, pp F.29) stating that the exposure parameters are not always used and by not attempting to identify relevant direct exposure patterns for children and to protect children. Major differences exist in the exposure parameters – note the 3 tables below that identify relevant risk information and direct exposure parameters for surface water, groundwater and soil in MTCA. Concurrent exposures, dermal + ingestion, are considered and evaluated in MTCA but are not considered or evaluated in this Draft HSW-EIS. Sauna or Sweat Lodge Air Inhalation. Imbedded within this exposure pathway is the implicit, not explicit, recognition of Native American cultural based habits (sweat lodge) that may account for environmental justice related concerns. As noted above, readily available documentation exists that more clearly documents cultural based behaviors with resulting exposure patterns that may place Native Americans at a disproportionate risk compared to the general population. This documentation should be recognized and used in the Draft HSW-EIS. |
| 87 |  | Health Impacts | Table of pollutant and ambient quality standard for short-term, workday and long-term exposures should be provided at the beginning of the discussion.   |
| 88 | Sections 5-11<br>Appendix F  | Health Impacts | Generally, it was difficult to follow the details of the health assessments, even for a person with training in radiological dose assessment. It was not always clear as to which exposure scenarios and assumptions were used for a given dose result. The information necessary to understand the details was often found scattered throughout the main document, the appendices, and outside documents. It was  |

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|    |  |                | difficult to follow section 5.11 without having to frequently consult Appendix F or the HSRAM document. Section 5.11 should be more self-contained.  |
| 89 | Sections 5-11<br>Appendix F                          | Health Impacts | What is the basis for choosing a point of assessment for groundwater at a distance of 1 km down gradient from the 200 West and 200 East Area LLBG? A distance of 1 km appears to be arbitrary. Why were groundwater concentrations not also estimated at the point of maximum impact, which is directly underneath the LLBG, or at the LLBG boundary?  |
| 90 | Sections 5-11<br>Appendix F                          | Health Impacts | Clarify whether or not a RCRA cover was assumed for any given set of groundwater concentration results.  |
| 91 | Sections 5-11<br>Appendix F                          | Health Impacts | Clarify the values that were used for the infiltration rate parameter. Values of 0.5 and 0.05 cm/y were cited throughout the document, however it is confusing as to which value was used for any given groundwater concentration result.  |
| 92 | Section 5.3.3, pp 5.19-20, Tables 5.9 and 5.10       | Health Impacts | Tables 5.9 and 5.10 would be enhanced if the Tc-99 and I-129 concentration values were given in addition to their percentage of Drinking Water Standard values. Otherwise, there is the possibility that the Tc-99 and I-129 values in the table may be confused with concentration values, instead of percentage of DWS.  |
| 93 | Section 5.3.3, pp 5.19-20, Tables 5.9 and 5.10       | Health Impacts | An additional table, similar to Table 5.9 and 5.10, should present groundwater concentrations at the LLBG boundary (see comment 1 above). As an example, Table 5.23, in section 5.11.1.3, presents health impacts to a resident gardener at the 1-km well (1 km down gradient from the 200 Area) from radionuclides in groundwater. The first point of confusion is that the resident gardener, as specified in Appendix F, is located 20.6 km from the 200 Area, but the table indicates that the assessment point is evaluated at 1 km from the LLBG. The second point of confusion is that the text does not make clear which exposure pathways are used in the dose calculations. The table caption leads one to think it is only groundwater pathways, but Appendix F indicates that other pathways, such as external radiation exposure from soil, are evaluated. If the table is indeed only for groundwater pathways, then where are the results for the other pathways discussed in Appendix F? For each dose result, it should be clear which exposure scenarios in Tables F.35 and F.37 are being used. The third point of confusion is that the reader must go back and forth between the main document, the appendices, and outside documents to find the details of the results given in the tables, and even then, it is still not clear as to which exposure scenarios are used, and as to what model parameter values are assumed. Each dose result should be clear as to what pathways and parameter values were used. |
| 94 | Section 5.11, p 5.42, Line 42                        | Health Impacts | What is the basis for choosing a distance of 100 m from the release point to assess the industrial scenario? The value of 100 m appears to be arbitrary.   |
| 95 | Section 5.11, p 5.42, Line 43                        | Health Impacts | Specify the location of the resident gardener in the resident gardener scenario. The location of a worker in the industrial scenario is specified here, so the location of the resident gardener should also be specified here, even though it is specified in Appendix F. Appendix F specifies that the resident gardener resides 20.6 km ESE of the 200 Area. Specify a familiar landmark near this location, for example LIGO.  |
| 96 | Section 5.11.1.2.1, pp 5.45-47, Tables 5.18 and 5.19 | Health Impacts | Footnote (b) in the tables should specify that the LCFs are calculated as described in Appendix section F.1.7.   |
| 97 | Section 5.11.1.2.1, p 5.45, Lines 17-18              | Health Impacts | Rather than simply stating that the dose estimates are small, summarize the results from Tables 5.18 and 5.19 by comparing the maximum lifetime dose from those  |

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|     |  |                | tables to any regulatory limits. For example, the maximum annual dose for the off-site MEI can be compared to the Washington State Air Emissions Regulations limit of 10 mrem/year.  |
| 988 | Section 5.11.4.1.1, p 5.97, Table 5.58 | Health Impacts | The text in section 5.11 and Appendix F states that the LCF estimates for the public are based on a conversion factor of 0.0005 LCFs per person-rem. The values for LCF in this table are not consistent with this value. For the 100 y and 500-y assessment time, the conversion factor appears to be 0.0004 - that for radiation workers, while for the 300 y assessment time, the factor appears to be 0.0007.  |
| 99  | Section 5.11.4.1.2, p 5.97, Line 11    | Health Impacts | Clarify what is meant by the dose being accumulated over a 50 year time period. Is this the 50-year period assumed for committed dose from inhalation and ingestion, or is it the lifetime exposure duration? If the latter, this is inconsistent with an assumed exposure duration period of 30 years used elsewhere in the health impact section.  |
| 100 | Page. S.18, Sect. S.8.3, Paragraph 1   | Health Impacts | Health effects appear to be limited to potential uptake of drinking water by citizens obtaining water from the Columbia River. One of the Hanford Site's remedial objectives is to restore groundwater to its "maximal beneficial use"; i.e., to make it potable. This analysis should also address impacts on groundwater within the Hanford Site before it discharges to the Columbia River.   |
| 101 | Page. S.18, Lines 43 – 46              | Health Impacts | Where is the analysis that supports the conclusion that 28 latent cancer fatalities could result from consequences arising from the occurrence of a design basis earthquake?   |
| 102 | Table S.1, Page S.11                   | Groundwater    | The disposal alternatives identified for Low-Level and Mixed Low Level_Waste Alternatives 1 and 2 and No Action do not indicate that groundwater monitoring will occur for the low-level waste trenches via RCRA groundwater monitoring networks designed to detect releases from the LLBG TSD and solid waste management units. The <i>Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document</i> (HNF-4755) appears to have omitted analysis associated with the construction/installation of groundwater monitoring wells, as well as monitoring costs. Considering the significant deficiencies associated with the existing RCRA groundwater monitoring networks as well as the size of the LLBG, the capital expenditure associated with installation and operation of a groundwater monitoring network capable of detecting releases from the low-level waste trenches could be significant. The networks will be designed (with installation of additional wells) via the RCRA final status permit issuance process. Groundwater monitoring will occur during operations of the LLBG units. Therefore, the Low-Level Waste Alternatives 1 and 2 should include indications that additional groundwater monitoring wells will be installed and groundwater monitoring will be performed throughout operations of the LLBG. The lack of analysis to consider installation of additional groundwater monitoring wells and groundwater monitoring renders the Draft HSW-EIS analysis incomplete and non-bounding. (§ 1502.14, 1502.15, and 1502.16) |
| 103 | Section S.8.4<br>Page S.20             | Groundwater    | The section's total numbers/ranges omit added potential (and estimated) costs associated with groundwater monitoring, <i>which could be significant, based on the deficiencies of the system.</i>  |
| 104 | Section S.8.5<br>Page S.20             | Ground-water   | The statement that "impacts for all resources considered in the Draft HSW-EIS are relatively small . . ." in relation to groundwater is included without a technical basis. For purposes of inclusion of a bounding RCRA groundwater monitoring needs  |

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|     |                                 |             | <p>analysis, Ecology's analysis indicates that a significant number of additional RCRA groundwater monitoring wells could be required for the LLBG groundwater monitoring networks to be compliant (i.e., for the groundwater monitoring system to consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that . . . "represent the quality of groundwater passing the point of compliance"). Therefore, either the statement must be deleted or a disclosure must be inserted. If a disclosure is inserted, it must identify that the RCRA groundwater monitoring networks associated with the LLBG are significantly deficient. It must also be disclosed that the RCRA groundwater monitoring networks are so deficient that no technically based conclusion of current or future impact in relation to groundwater can be made for the units at this time.</p> <p>(§ 1502.7, 1502.14, 1502.15, and 1502.16)</p> |
| 105 | Section 3.0<br>General Comment  | Groundwater | <p>Section 3.0. The section does not appear to include groundwater monitoring in any of the alternatives. Similarly, the section does not appear to include cost evaluations for groundwater monitoring well installation needs. It is recommended that a description of LLBG RCRA groundwater monitoring requirements be included in Sections 3.1, 3.2, and 3.3 and that cost estimates for these actions be included in Section 3.7 and in Table 3.6. It should be noted that groundwater monitoring requirements are applicable to all alternatives. Considering the logic applied to the No Action alternative whereby "currently defined LLBG" are analyzed to manage waste, then the No Action alternative should also include groundwater monitoring costs.</p> <p>(§ 1502.23)</p>   |
| 106 | Section 3.7<br>And<br>Table 3.6 | Groundwater | <p>The section does not include groundwater monitoring in the comparison of costs of alternatives. Washington Administrative Code (WAC) 173-303-645 requires groundwater monitoring at RCRA land-based TSDs. WAC 173-303-645 requires groundwater monitoring at the point of compliance for detection of contaminants. Furthermore, the same regulation requires "the groundwater monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that . . . represent the quality of groundwater passing the point of compliance." It is recommended that costs be estimated for data evaluation (including statistical analysis between up-gradient and down-gradient wells) and reporting over a 74 year groundwater monitoring period.</p> <p>(§1502.14, 1502.15, 1502.16 and 1502.23)</p>  |
| 107 | p. A.14                         | Groundwater | <p>The response to comments concerning groundwater does not appear to address the commenters' issue of the adequacy of data about existing vadose zone contamination. Please explain how the SAC and related activities provide adequate data.</p>  |
| 108 | Table S.3, Page S.19            | Groundwater | <p>The Draft HSW-EIS groundwater quality impact analysis assumed an infiltration rate modeling input parameter that is an order of magnitude less conservative than the same infiltration rate modeling input parameter used to support USDOE's LLBG disposal authorization basis. The use of the less conservative modeling input parameter is not supported by a technical basis as no such technical basis exists. Of regulatory concern to Ecology, the Draft HSW-EIS groundwater quality impact</p>  |

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|     |  |             | analysis selects “points of assessment” to describe groundwater quality impacts. None of the “points of assessment” selected meet RCRA regulatory requirements for monitoring groundwater quality at the LLBG “point of compliance.” While RCRA defines the groundwater point of compliance to be at the unit boundary, the Draft HSW-EIS’s nearest “point of assessment” is located 1 km away from the LLBG unit boundaries. The affect of selecting such a “point of assessment” away from the LLBG unit boundaries is to greatly reduce groundwater quality impacts. This methodology is inconsistent with RCRA regulatory requirements and could be considered to be misleading (i.e., the approach masks and/or reduces groundwater quality impacts). Detailed comments regarding the above issues are attached. In summary, the Draft HSW-EIS groundwater quality impact analysis is deficient and is neither conservative nor consistent. |
| 109 | Section S.8, Page S.17, Lines 43-44                  | Groundwater | The analysis provided in the Draft HSW-EIS is neither conservative nor consistent with similar analyses performed to support the USDOE’s LLBG disposal authorization basis. Furthermore, the basis for the Draft HSW-EIS groundwater evaluations of groundwater quality is inadequate and does not support an assumption of no current impact from the LLBG.   |
| 110 | Section 1.5.1.3, Page 1.16                           | Groundwater | The Draft HSW-EIS does not adequately and/or accurately reflect groundwater and/or corrective action regulatory requirements applicable to an evaluation of reasonable alternatives or mitigation measures. Deficiencies in the current groundwater monitoring networks should be addressed, including an estimation of the number and cost of needed wells, or acceptable alternative monitoring where wells cannot be constructed because of a declining water table. Without this information, the cost analysis is incomplete.   |
| 111 |  | Groundwater | Ecology has concluded that the Draft HSW-EIS groundwater quality impact analysis does not provide an evaluation of reasonable alternatives or mitigation measures to reduce or minimize adverse impacts to groundwater. This conclusion is primarily based on the following: 1) the insufficiency of existing groundwater quality information, 2) a lack of groundwater impact modeling conservatism (in light of the lack of LLBG-specific data), 3) an inadequate consideration of applicable regulatory requirements, and 4) inconsistencies associated with the groundwater impact analysis methodology. Ecology has concluded that the groundwater quality impact analysis provides neither the basis for the alternatives evaluated nor the basis for the omission of mitigation measures.   |
| 112 | Section S.6.1, Page S.10<br>Section S.6.2, Page S.12 | Groundwater | The section is silent on RCRA groundwater monitoring requirements. The section should identify that RCRA groundwater monitoring requirements will be imposed via the RCRA final status permit. In addition, it should be identified that groundwater monitoring provisions will address the entire LLBG unit boundaries (as defined by RCRA Part A permit).<br>(§ 1502.14, 1502.15, and 1502.16)   |
| 113 | Table S.1, Page S.11                                 | Groundwater | The disposal alternatives identified for Low-Level and Mixed Low Level Waste Alternatives 1 and 2 and No Action do not indicate that groundwater monitoring will occur for the low-level waste trenches via RCRA groundwater monitoring networks designed to detect releases from the LLBG TSD and solid waste management units. The <i>Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document</i> (HNF-4755) appears to have omitted analysis  |

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|     |  |             | associated with the construction/installation of groundwater monitoring wells as well as monitoring costs. Considering the significant deficiencies associated with the existing RCRA groundwater monitoring networks as well as the size of the LLBG, the capital expenditure associated with installation and operation of a groundwater monitoring network capable of detecting releases from the low-level waste trenches could be significant. The networks will be designed (with installation of additional wells) via the RCRA final status permit issuance process. Groundwater monitoring will occur during operations of the LLBG units. Therefore, the Low-Level Waste Alternatives 1 and 2 should include indications that additional groundwater monitoring wells will be installed and groundwater monitoring will be performed throughout operations of the LLBG. The lack of analysis to consider installation of additional groundwater monitoring wells and groundwater monitoring renders the EIS analysis incomplete and non-bounding.<br>(§ 1502.14, 1502.15, and 1502.16) |
| 114 | Appendix G; Page. G.4, Line 27                                   | Groundwater | What is “an appropriate release model?”  |
| 115 | Chapter 4; Page. 4.38, Paragraph 1                               | Groundwater | Old, abandoned and/or poorly sealed vadose zone and groundwater wells are also potential preferential pathways and should be mentioned here.   |
| 116 | Chapter 4; Page. 4.36, Sect. 4.5.1.4, Paragraph 1                | Groundwater | Assuming that groundwater recharges West Lake and that groundwater is or has flowed from the 200 East Area toward West Lake, the salts deposited from evaporation could potentially contain some Hanford contaminants. Runoff could also carry contaminated material to West Lake. This possibility should at least be mentioned.  |
| 117 | Chapter 4; Page. 4.42, Fig. 4.16                                 | Groundwater | Water table contours north and east of the Columbia River indicate significant differences in the elevation of the water table. However, north and east of the Columbia, there are no well locations shown, so it is difficult to determine how these elevations were obtained. What is the source of these elevation/head data?   |
| 118 | Chapter 4 Page. 4.43, Fig. 4.17                                  | Groundwater | Two meter contours do not convey a clear picture of water table elevation. Supplemental contour lines at 0.5m intervals should be added to this map.   |
| 119 | Chapter 4; Page. 4.47, Table 4.9                                 | Groundwater | Is the value for Cr for total Cr, hexavalent Cr? Please clarify.   |
| 120 | Chapter 4; Page. 4.49, Sect. 4.5.3.3, Paragraph 1, Lines 36 – 39 | Groundwater | The communication between the unconfined and confined aquifers is grossly understated. With the Elephant Mountain member of Columbia River basalt absent in at least two boreholes north of the 200 East Area, the unconfined and confined aquifers (Rattlesnake Ridge member) are in direct contact in a window of unspecified dimensions. Correct this understatement.   |
| 121 | Chapter 4; Page. 4.50, Paragraph 3                               | Groundwater | Artificial recharge to the unconfined aquifer continues in the form of discharge of sanitary waste liquids and water from leaking raw water distribution lines. These sources should be added.   |
| 122 | Chapter 4; Page. 4.50, Paragraph 4                               | Groundwater | A supporting basis needs to be added for the following statement, “. . . no indication is shown of aquifer interconnection.” How do the piezometric heads in the unconfined and confined aquifer systems compare across the site? It also needs to be made clear whether reference to deeper aquifers is to the basalt confined aquifer system or to the semi-confined aquifers beneath the Ringold Lower Mud.   |
| 123 | Appendix G; Page. G.6, Line 25                                   | Groundwater | The statement is made that there are more than 100 radioactive and non-radioactive constituents that could potential impact groundwater. Thereafter, the entire analysis is based on various categories of radionuclides which may simulate the behavior of  |

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|     |   |                           | non-rad constituents in flow and transport, but which present different hazards to humans if they get to groundwater and are consumed. Only Pb and Hg are evaluated (pg. G.9) and dismissed. Justify these exclusions.  |
| 124 | Appendix G<br>Page. G.21, Lines 14 – 16, 19 – 20      | Groundwater               | Earlier, the statement was made that a one dimensional model was used because of insufficient characterization. Yet, here you state that one-dimensional models are inadequate to represent preferential pathways (unsealed boreholes, clastic dikes) and indicate that they are too small and discontinuous to be of any real significance as a preferential pathway. Without adequate characterization data, how can you make this assumption?  |
| 125 | Appendix G; Page. G.24, Fig. G-2 and<br>Lines 12 – 13 | Groundwater               | If this is purported to be a conservative analysis, justify the decision to determine a release date when 50% of unit mass has reached groundwater. This is even less conservative given that releases are assumed to begin in 2046.  |
| 126 | Appendix G; Page. G.33                                | Groundwater               | Has any consideration been given to showing the cumulative releases to the Columbia River from all isotopes/constituents for different projected dates (e.g., 1,000, 5,000, 10,000 yrs.)?   |
| 127 | Table 5.1, Page 5.4                                   | Conclusions Not Supported | Land use commitments are listed on Table 5.1. In an effort to confirm bounding scenarios, the referenced <i>Technical Information Document</i> (FH 2002) was reviewed for a cursory accuracy check. To explain, on page 5.3, lines 9-11, it is indicated that “except where otherwise specified, all construction and operations engineering data that form the basis for environmental impact analysis of the alternatives are provided in the <i>Technical Information Document</i> prepared by Fluor Hanford (FH 2002).” When the land use commitments of Table 5.1 for “218-W-5 Exp” were checked in the referenced document, it was found that there are no impact analysis numbers included for this “contingency expansion” (see Appendix D, pages D-13 and D-14, Section D5.1 of <i>Technical Information Document</i> [FH 2002]). It should be noted that the “contingency expansion” of 202 hectares represents just less than half of the LLBG sub-total (425 hectares). The omission and the lack of an accompanying explanation are significant. Considering the zeros listed for upper and lower bounds, it is concluded that no impact analysis has been done for this 202 hectare “contingency expansion.” If such an expansion were deemed necessary in the future, an additional NEPA review would be appropriate. Currently, such an omission renders the analysis incomplete and non-bounding. In addition, such an omission reduces confidence of the analysis referenced as being complete without an explanation for omission of numbers. Therefore, either remove the “218-W-5 Exp” from the scope of the Draft HSW-EIS or include the supporting bounding analysis. (§1502.7, 1502.14, 1502.15, 1502.16 and 1502.23) |
| 128 | Table 5.1, Page 5.4                                   | Conclusions Not Supported | The land use commitment for 218-W-6 is identified as zero in several alternatives. No lettered note is indicated for the burial ground. The zeros could mean that this unit is currently unoccupied and that there is no intention of using the burial ground. Or, the zeros could mean that this unit is currently unoccupied and that there will be no disposal in the future, merely interim storage. Or, the zeros could mean that this unit is currently unoccupied and that the Draft HSW-EIS impact analysis was omitted. In an attempt to understand what the zeros mean, the referenced <i>Technical Information Document</i> (FH 2002) was reviewed. On pages D-13 through D-17, it is indicated on Tables D5-2 through D5-D10 that the total area of the burial ground is 16 but that the area to be capped under all scenarios is zero. From a third document   |



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|     |   |                           | <p>(Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds [DOE/RL-2000-72, Rev. 0]) it is indicated that the 218-W-6 burial ground has not yet received any waste and is reserved for future mixed waste disposal. If the 218-W-6 burial ground is to be used for mixed waste, all alternatives should analyze land use commitments for the unit (16 hectares). In summary, from Section 5.1, there is inadequate explanation or even reference to a document where it may be understood for the reader/decision-maker to understand what the land use numbers mean under the various scenarios and alternatives. (§1502.7, 1502.14, 1502.15, 1502.16 and 1502.23)</p>                 |
| 129 | Page E.1, Line 25                                 | Conclusions Not Supported | The reference 4.2.3 could not be found  |
| 130 | Page E.3, Line 17                                 | Conclusions Not Supported | All modeling assumptions should be listed.  |
| 131 | 2.1.3.1, Page 2.9                                 | Conclusions Not Supported | USDOE states that, for the post-1970 TRU waste, “observations and monitoring of the area around the drums within the trenches has not detected the release of any alpha emitters, such as plutonium.” It is Ecology’s position that the current monitoring system is inadequate for detecting releases into the soil and/or groundwater from these trenches. USDOE does not state if the monitoring that was done detected releases from sources other than alpha emitters. (Supporting data)   |
| 132 | Sec. S.3, pp. S.2-S.3                             | Conclusions Not Supported | The scope of this Draft HSW-EIS was narrowed, based on the issuance of the Record of Decision under the WM-PEIS. However, the WM-PEIS did not provide adequate information for decision-makers to select among specific sites, based on a comparison of site-specific impacts. In response to numerous comments about the inadequacy of site-specific environmental information in the Draft WM-PEIS, USDOE repeatedly referred commenters to the “Technical Report on Affected Environments.” That document is apparently not available to reviewers of the Draft HSW-EIS, meaning that USDOE has still not provided the public an adequate basis for assessing impacts of treatment or disposal at alternate sites. |
| 133 |   | Conclusions Not Supported | The Draft HSW-EIS is a very complex document. Numbered sections in Volume 1 refer the reader for details to the lettered sections in Volume II. However, in Volume II, the equations, their derivations, and a range of values are not consistently presented for the reader to use in an independent verification of the calculations. For example, the equations used by RADTRAN 4 (Appendix H) are missing, but the basic air emission equation is shown in Appendix E (Equation E.1 on page E.9).   |
| 134 | Chapter 5; Page. 5.12, Sect. 5.3.1, Lines 33 – 36 | Conclusions Not Supported | Provide a basis for this expectation.   |
| 135 | Chapter 5; Page. 5.12, Sect. 5.3.1, Lines 37 – 42 | Conclusions Not Supported | Provide a basis for this expectation. Specify where in the vadose zone (i.e., how deep in relation to the water table and/or below trench bottoms) LLBG contaminants have infiltrated and at what rate are they infiltrating toward groundwater.  |
| 136 | Chapter 5; Page. 5.13, Lines 9, 10                | Conclusions Not Supported | Provide a basis for this expectation.   |
| 137 | Chapter 5; Page. 5.14, Lines 10, 11               | Conclusions Not Supported | Until such time as retrievably stored TRU wastes are retrieved, processed and shipped off-site, they are part of the vadose zone inventory attributable to the LLBG and should be included. Previous Hanford plans have gone awry (e.g., Grout), so until these TRU wastes are removed, or there is a firm schedule commitment and  |

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|     |   |                           | budget to accomplish the removal, they should be included as part of the inventory.   |
| 138 | Chapter 5; Page. 5.16, Lines 16 – 34            | Conclusions Not Supported | Recent investigations at SST WMA S-SX indicate that sorption (i.e., distribution) coefficients may be variable because of waste and soil characteristics. Is it appropriate to use single values for all these contaminants throughout the entire vadose zone? Cobalt is indicated as belonging to Group 5; i.e., strongly sorbing. However, Co-60 will complex with organics and other constituents and become much more mobile. Are there any co-contaminants present in the waste or soil that would result in changed mobility for any other of the Group 5 constituents?   |
| 139 | Chapter 5; Page. 5.12, Sect. 5.3, Lines 16, 17  | Conclusions Not Supported | Provide a basis for the statement, “None of these contaminants are thought to have originated from the LLBG.”   |
| 140 | Chapter 5; Page. 5.12, Sect. 5.3, Lines 19 – 23 | Conclusions Not Supported | How many of the listed contaminants were discharged in any form to any of the LLBG?   |
| 141 | Section S.8                                     | Editorial                 | General statements and assertions are made here. As this is a summary, the appropriate part of the document that addresses these specific issues (e.g., Land Use, Human Health) should be cited to allow the reader to verify that the supporting analyses provide the analytical basis for the assertions made in this section.  |
| 142 | Page S.19, Table S.3                            | Editorial                 | Reference (here) should be made to the source and/or analyses that support the various quantities and conclusions listed in this table under various categories.  |
| 143 | Page. S.18, Line 10                             | Editorial                 | Define and locate the “200 Area Industrial-Exclusive zone,” preferably on a map.  |
| 144 | Chapter 4; Page. 4.25, Figure 4.9               | Editorial                 | This is taken from a BWIP document and shows a location labeled “Candidate Site.” This is most likely the Reference Repository Location (RRL), the candidate for a basalt high-level nuclear waste repository at Hanford. This location is irrelevant to this Draft HSW-EIS and should be removed.  |
| 145 | Chapter 4; Page. 4.31, Line 9                   | Editorial                 | Delete the word “all.” These are the known earthquakes, but others may have occurred, so the map is likely incomplete.  |
| 146 | Chapter 4; Page. 4.32, Line 10                  | Editorial                 | Insert word “known” between “all” and “earthquakes.” Same reason as previous comment.   |
| 147 | Chapter 4 Page. 4.45, Lines 1 through 5         | Editorial                 | These two sentences are not clear. Rewrite for clarity. The USDOE’s DCG is somewhat self-serving and not nearly as protective of human health and the environment as the DWS/MCL.   |
| 158 | Chapter 5; Page. 5.16, Lines 36, 37             |                           | Provide a justification as to why analyses of chemical constituents were not performed.   |
| 149 | Section 6.3, Page 6.2, Lines 23-25              | Editorial                 | The paragraph includes several statements that are out of date. Update and clarify the description of the Hanford Site RCRA permit. Recommended wording for the sentence in lines 26-27 is: “The Hanford Site’s RCRA permit was originally issued in two portions, one portion was issued by EPA Region X and the other portion was issued by Ecology.” Similarly, recommended wording for the sentence in lines 27-28 is: “The EPA-issued portion of the RCRA permit covered the Hazardous and Solid Waste Amendments portion of the RCRA permit for the U.S. Ecology Site located on the Hanford Site (EPA 1994).” Similarly, recommended wording for the sentence in lines 28-30 is: “The second portion of the Hanford Site RCRA permit covered the dangerous waste provisions and was issued by Ecology (Ecology 1994).” Similarly, recommended wording for the sentence in lines 29-30 is: “The Hanford Site RCRA |

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|     |                                      |  | <p>permit was recently modified for Ecology to cover Hazardous and Solid Waste Amendments (i.e. via Ecology's RCRA Corrective Action authorization) previously not included in the permit." Similarly, recommended wording for the sentence in lines 30-33 is: "The Ecology portion of the RCRA permit includes standard conditions, general facility conditions, and specific conditions for individual operating treatment, TSD units and SWMUs undergoing corrective action, and TSD units undergoing closure.</p> <p>(§1502.7)</p> |
| 150 | Sec. 3.7, p. 3.15                    |  | <p>Please explain how the costs reflected in Table 3.6 are consistent with those presented in USDOE's Report to Congress on the Cost of Waste Disposal (July 2002). Note the following statement on p. A-39 of the latter report: "Hanford does not have cost estimates for long-term stewardship."</p>  |
| 151 | Appendix G; Page. G.4, Line 28       |  | <p>Use of a 1-D model for vadose zone transport is rather simplistic. Justify this choice.</p>   |
| 152 | Page. S.18, Sect. S.8.3, Paragraph 1 |  | <p>Health effects appear to be limited to potential uptake of drinking water by citizens obtaining water from the Columbia River. One of the Hanford Site's remedial objectives is to restore groundwater to its "maximal beneficial use"; i.e., to make it potable. This analysis should also address impacts on groundwater within the Hanford Site before it discharges to the Columbia River.</p>  |
| 153 | Page. S.18, Lines 43 – 46            |  | <p>Where is the analysis that supports the conclusion that 28 latent cancer fatalities could result from consequences arising from the occurrence of a design basis earthquake?</p>  |
| 154 | Chapter 4; Page. 4.42, Fig. 4.16     |  | <p>Water table contours north and east of the Columbia River indicate significant differences in the elevation of the water table. However, north and east of the Columbia, there are no well locations shown, so it is difficult to determine how these elevations were obtained. What is the source of these elevation/head data?</p>  |